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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,273	06/22/2001	David W. Burns	2207/ 11315	8639

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EXAMINER
MEONSKE, TONIA L

ART UNIT	PAPER NUMBER
2181	

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10/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	09/888,273	BURNS ET AL.
	Examiner	Art Unit
	Tonia L. Meonske	2181

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>July 19, 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-10,12-18,20-26 and 28-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2, 4, 5, 6,7,9,10,15,17,18,23,25 and 26* is/are rejected.

7)☒ Claim(s) *8,12-14,16, 20-22, 24 and 28-30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

2.   Claims 2 and 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

3.   Referring to claim 2, in line 2, the limitation "a value stored in the first starting

counter" is unclear. Is the value the same value in claim 1, line 9, or some other value?

Please clarify. Appropriate correction is required.

4.   Claims 4-6 are rejected for incorporating the defects of claim 2.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

2.   Claims 1, 2, 7, 9, 10, 15, 17, 18, 23, 25 and 26 are rejected under 35

U.S.C. 102(e) as being anticipated by Johnson, US Patent Application Publication No.

US 2002/0138670 (Hereinafter Johnson).

3.   Referring to claim 1, Johnson has taught a method of assigning thread priority

comprising:

a.   assigning priority to a first thread in a multi threaded processor (page 2,

paragraphs [0021] and [0022], Figure 2, element 20, Figure 3, element 102,

Priority is assigned to a first I/O request, or thread, based on the priority of the

LUN submitting the request.);

b.   loading a preliminary value to a thread precedence counter (page 2,

paragraphs [0021] and [0022], The high priority counter is loaded with an

initialization value of zero. For each high priority I/O request received, the High

Priority counter, element 26, increments the high priority counter to a preliminary

value.);

c.   assigning priority to a second thread in response to expiration of said

thread precedence counter (page 2, paragraphs [0021] and [0022], Figure 4,

elements 156, 158, and 162, A low priority request is sent to the device driver in

response to the high priority counter, or thread precedence counter, expiring.);

d.   determining if there is an indication of approaching instruction side

starvation for said first thread wherein instruction fetching for said first thread

would be blocked due to processing one or more instructions from another thread

(Figure 4, elements 164 and 166, The starvation counter determines when I/O

requests, or threads, would be blocked from being fetched by the device driver

due to other I/O requests, or other threads.); and

e.   incrementing a value stored in a first starting counter in response to an

indication of approaching instruction side starvation for said first thread (Figure 4,

element 172).

4.   Referring to claim 2, Johnson has taught the method of claim 1, as described

above, and wherein said preliminary value is based on the value stored in the first

starting counter associated with said first thread (Figure 3, The incremented preliminary

value, determined at element 108, is based on the priority value assigned and

determined at elements 102 and 104.).

5.   Referring to claim 7, Johnson has taught a method of assigning thread priority

comprising:

a.   assigning priority to a first thread in a multi threaded processor (page 2,

paragraphs [0021] and [0022], Figure 2, element 20, Figure 3, element 102,

Priority is assigned to a first I/O request, or thread, based on the priority of the

LUN submitting the request.); and

b.   assigning priority to a second thread (Figure 4, element 162, A low priority

request is sent to the device driver.) in response to one of a plurality of conditions

being true, the conditions consisting of

i.   if a thread precedence counter expires (Figure 4, elements 156 and

158, A low priority request is sent to the device driver if the high priority

counter, or thread precedence counter, expires.);

ii.   if processing of said first thread retires an instruction from said first

thread (This element not required as it is claimed in the alternative.); and

iii.   if there is not an indication of approaching instruction side

starvation for said first thread wherein instruction fetching for said first

thread would be blocked due to processing one or more instructions from

another thread (This element not required as it is claimed in the

alternative.).

6.   Referring to claim 17, Johnson has taught a computer system comprising:

a.   a memory to store instructions for first and second threads (Figure 2, at

least elements 24 and 22);

b.   a processor including control logic coupled to said memory to assign

priority between said first and second threads (Figure 2, elements 8 and 20);

c.   a thread precedence counter coupled to said control logic (Figure 2,

element 26) wherein priority is assigned to said second thread after said thread

precedence counter expires (Figure 4, element 162) wherein said control logic is

to determine if there is an indication of approaching instruction side starvation for

said first thread wherein instruction fetching for said first thread would be blocked

due to processing one or more instructions from another thread (Figure 4,

elements 164 and 166, The starvation counter determines when I/O requests, or

threads, would be blocked from being fetched by the device driver due to other

I/O requests, or other threads.) and to increment a value stored in said first

starting counter in response to an indication of approaching instruction side

starvation for said first thread (Figure 4, element 172).

7.   Claims 9, 10, 15, 18, 25 and 26 have nothing over claims 1, 2, 7, 2, 17 and 2,

respectively, and are therefore rejected for the same reasons as set forth in claims 1, 2,

7, 2, 17 and 2.

8.   Claim 23 has nothing over claims 7 and 17 and is therefore rejected for the same

reasons as set forth in claims 7 and 17.

Response to Arguments

9.   Applicant's arguments filed July 19, 2007 have been fully considered but they are

not persuasive.

10.   On pages 12 and 13, Applicant argues in essence:

> "Applicants respectfully submit nowhere in Johnson is the teaching or suggestion
> of a method of *assigning thread priority comprising determining if there is an*
> *indication of approaching instruction side starvation for said first thread wherein*
> *instruction fetching for said first thread would be blocked due to processing one*
> *or more instructions from another thread (e.g., as described in claim 1).*
>
> *The Office Action asserts Johnson teaches the relevant limitations, citing Figure*
> *4, elements 164 and 166. See Office Action dated 3/19/2007, paragraph 19.*
> *Applicants disagree.*
>
> *The description of elements 164 and 166 of Figure 4 is as follows: "In such case,*
> *the device driver filter 8 determines (at block 164) whether there are any deferred*
> *I/Os pending in the low priority I/O queue 24. If not, then control ends as no*
> *consideration of any deferred low priority I/Os is necessary. Otherwise, if there*
> *are deferred low priority I/Os, then the device driver filter 8 determines (at block*
> *166) whether the starvation counter 28 is at the maximum possible value."*
>
> *The cited element block 164 describes determination of whether there are any*
> *deferred I/Os pending in a low priority queue, and if not, discontinuing*
> *consideration of low priority I/Os. Otherwise, at block 166, a device driver filter*
> *determines whether a starvation counter is at the maximum possible value.*
>
> *Applicants submit the cited section fails to teach or suggest the relevant*
> *limitations, for at least the reason that it does not describe determining if there is*
> *an indication of approaching instruction side starvation for said first thread or*
> *blocking instruction fetching for said first thread due to processing one or more*

instructions from another thread. Indeed, the cited section does not describe instruction side starvation or blocking instruction fetching even generally." However, in Johnson when there are low priority instructions that are waiting to be executed and the counter is not at a maximum value, then that is interpreted to be an indication of approaching instruction side starvation because the lower priority instructions/requests are being starved from being fetched or retrieved from the device driver. The lower priority request is starved or blocked from being fetched by a higher priority request. As a result the starvation counter is incremented which will ultimately prevent instruction side starvation. Therefore Johnson has in fact taught assigning thread priority comprising "determining if there is an indication of approaching instruction side starvation for said first thread wherein instruction fetching for said first thread would be blocked due to processing one or more instructions from another thread" as in claim 1 (see Figure 4). Therefore this argument is moot.

Allowable Subject Matter

11. Claims 8, 12-14, 16, 20, 21, 22, 24 and 28-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

13.   A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.
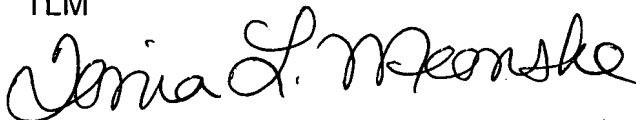
14.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Tonia L. Meonske whose telephone number is (571)

272-4170. The examiner can normally be reached on Monday-Friday with first Friday's

off.

15.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Alford Kindred can be reached on (571) 272-4037. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

16.   Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TLM

/Tonia L. Meonske/
Tonia L. Meonske
September 20, 2007